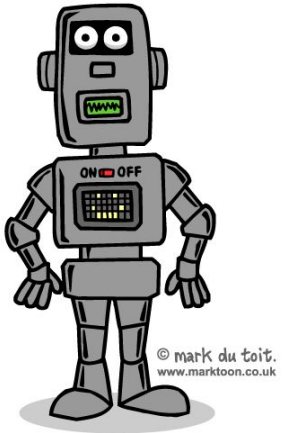
Electronic Components

FeMaidens 2265

Aim: What are the Electronic components of a robot?

Do Now: What do you think of when you hear the word "robot"? What about the word "electronics"? What is the definition of a component?

Component: A part or element of a larger whole, especially a part of a machine or vehicle



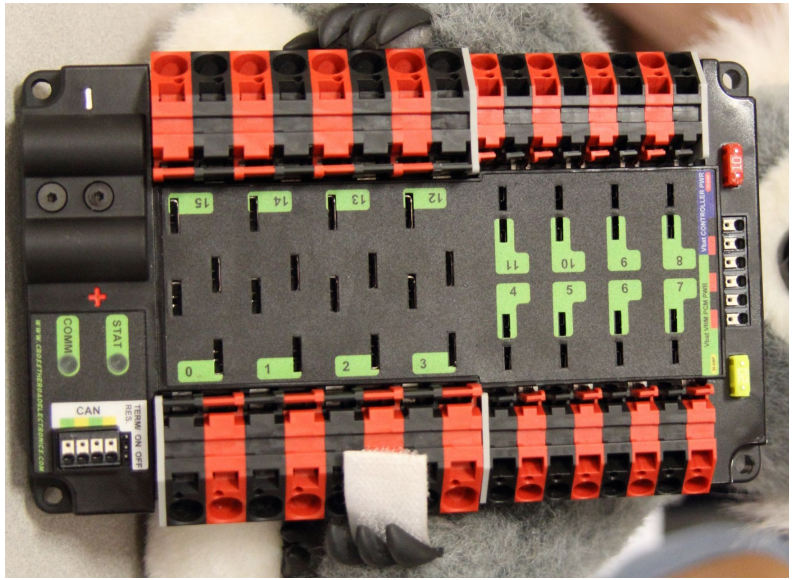
Power Distribution Board (PDB)

Distributes the power in order for the robot to function

-Battery Input Voltage: 6-15V

-Smaller outputs: 30A breakers

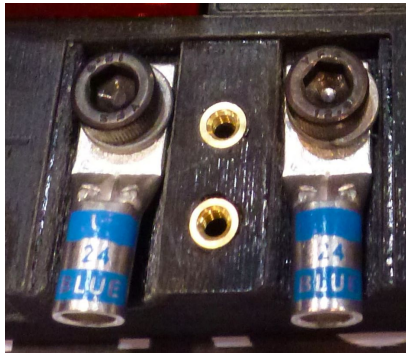
-Bigger outputs: 40A breakers



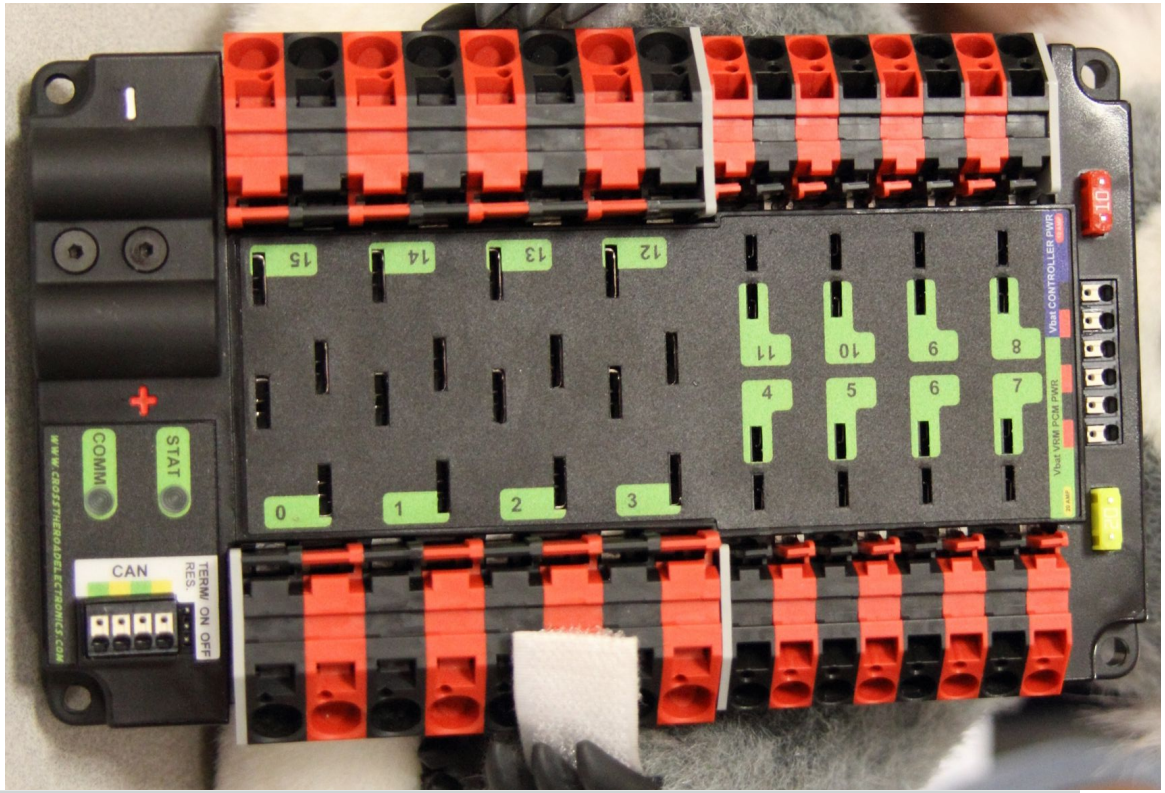
A **circuit breaker** is an automatically operated electrical switch designed to protect an electrical **circuit** from damage caused by overload or short **circuit**

PDB Continued...

- Negative -- Negative
- Positive -- Positive
- Black: Negative
- Red: Positive



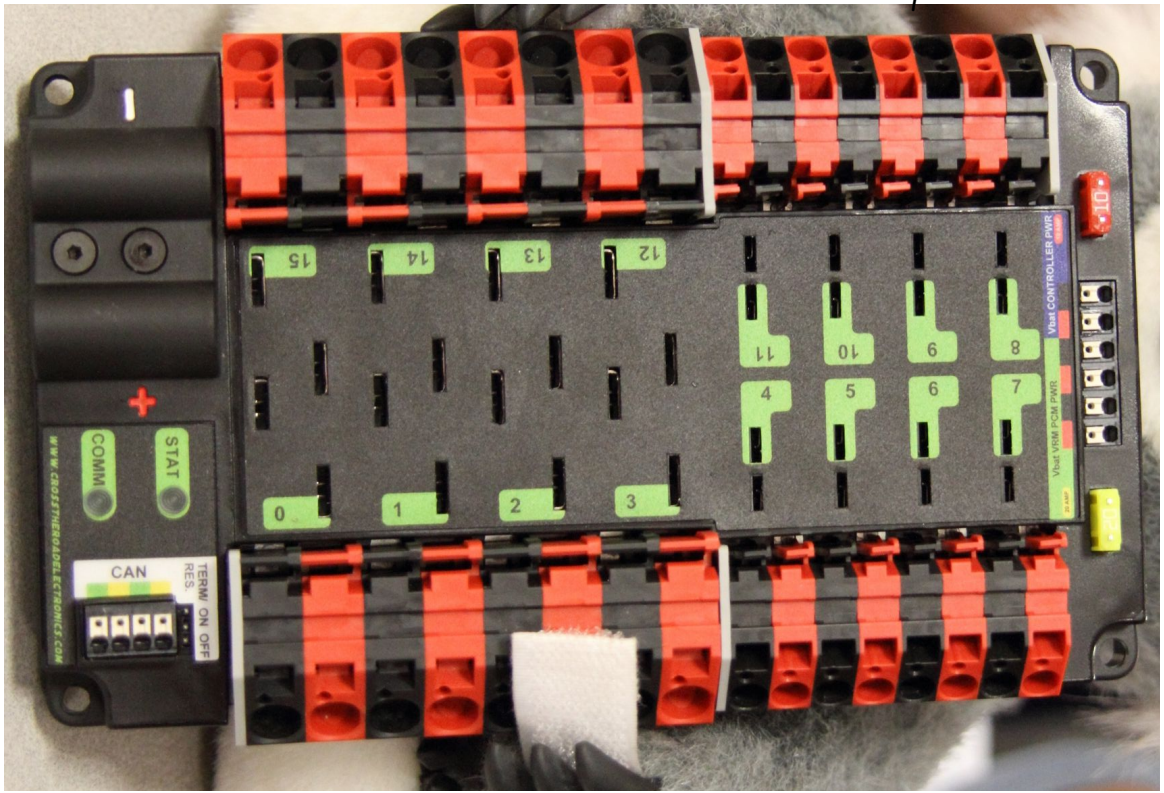
Never mix colors!



Jaguar Motor Controllers or
Talon SR(X) Motor controllers

Voltage Regulator Module (VRM)
+ Relay

Battery (negative) Main Breaker (positive)



Pneumatic Control Module (PDM)

Pneumatic Control Module (PDM) + RoboRIO + Voltage Regulator Module (VRM)

Speed Controllers

Jaguars → Victors → Talons : control the speed of the motors

Power Distribution Board: Green (negative) + White (positive)

Motor: red (positive) + black (negative)

Motor

Converts any form of energy to **mechanical** energy: makes the robot move

Wires Connect Talons with motor:

roboRIO

"THE BRAIN" → sends and translates code for other components in the robot

Battery

Supplies power to the robot

Main Breaker

Turns the robot on or off

Signal Light

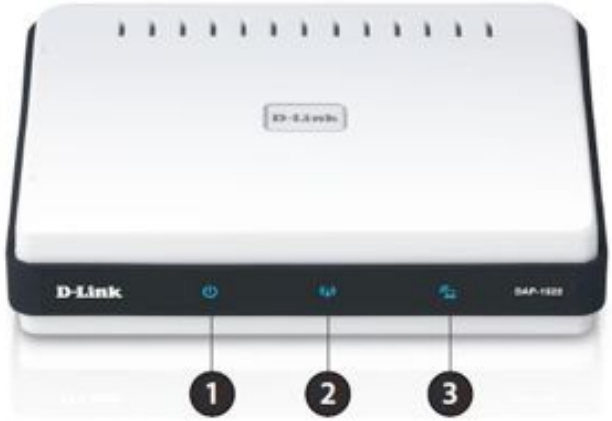
Light on → Robot on

Should blink every 1.5 seconds

Light off → Robot off

Radio

Sends signals to laptop by ethernet cable or wifi



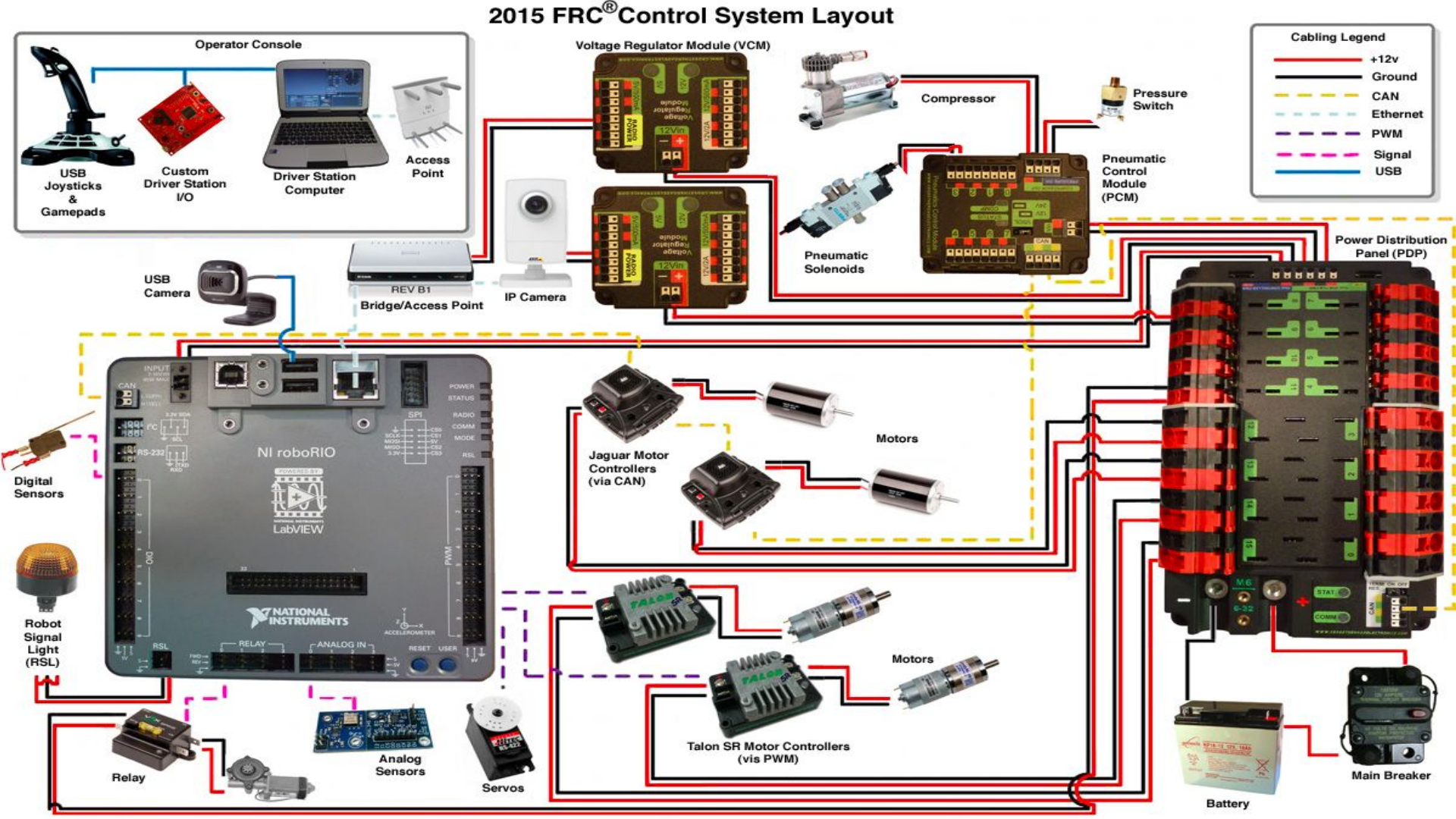
1	Power LED	A solid blue light indicates a proper connection to the power supply.
2	AP LED	A solid light indicates that the DAP-1522 is in AP mode.
3	Bridge LED	A solid light indicates that the DAP-1522 is in bridge mode.
4	WPS LED	A solid light indicates a successful WPS connection. A blinking light indicates the device is trying to establish a connection.

PWM Wires vs Wet Noodle Wires

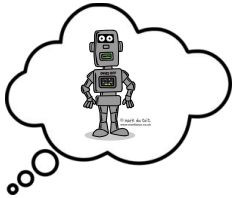
PWM Wires: Connect speed controllers to roboRIO

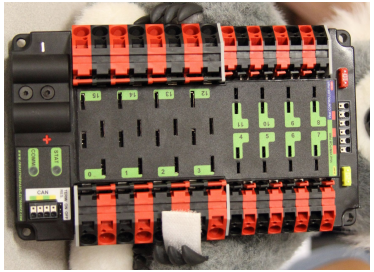
Wet Noodle Wires: Connect speed controllers to PDB and motors

2015 FRC® Control System Layout



Closing Thoughts...





Continuation of Closing Thoughts...

1. Power Distribution Board	a. sends signals to laptop
2. Speed Controllers	b. converts form of energy into mechanical
3. Motor	c. Turns robot on or off
4. Roborio	d. Indicates robot is on or off
5. Battery	e. Supplies power to robot
6. Main Breaker	f. controls speed of motor
7. Signal Light	g. connect speed controllers to roboRIO
8. Radio	h. distributes power to the robot
9. PWM wires	i. connects speed controllers to PDB and motors
10. Wet noodle wires	j. the "BRAIN"